

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
19 February 2004 (19.02.2004)

PCT

(10) International Publication Number  
**WO 2004/015666 A1**

- (51) International Patent Classification<sup>7</sup>: **G09G 3/28**
- (21) International Application Number:  
PCT/IB2003/002819
- (22) International Filing Date: 26 June 2003 (26.06.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
02078100.1 29 July 2002 (29.07.2002) EP
- (71) Applicant (for all designated States except US): **KONINKLIJKE PHILIPS ELECTRONICS N.V.** [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **SALTERS, Bart, A.** [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL); **HOLSTLAG, Antonius, H., M.** [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL); **VOSSEN, Fransiscus, J.** [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL); **DERKSEN, Sander** [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL); **DE ZWART, Siebe, T.** [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL); **ENGELAAR, Pieter, J.** [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL); **VAN LIESHOUT, Petrus, J., G.** [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).

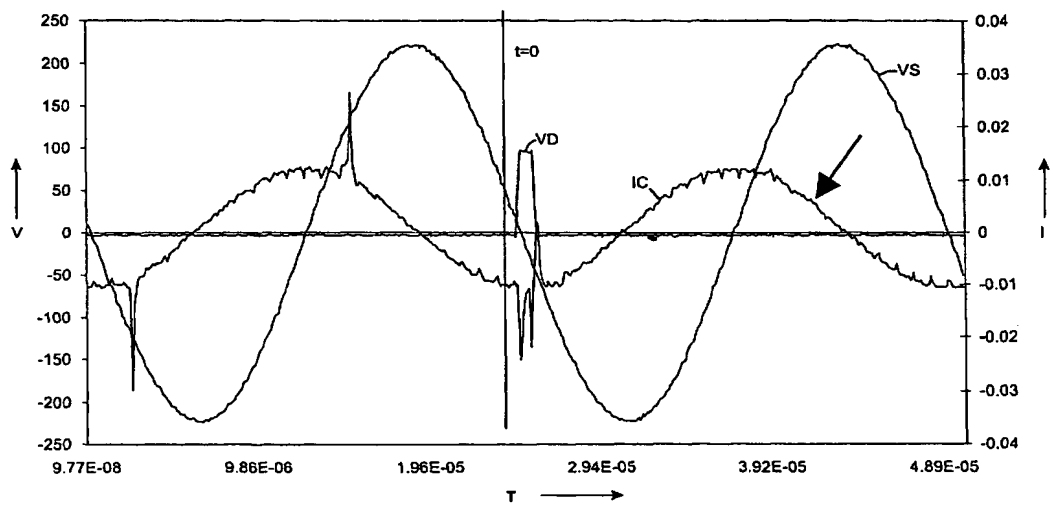
- (74) Agent: **DEGUELLE, Wilhelmus, H., G.**; Philips Intellectual Property & Standards, Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Declaration under Rule 4.17:**

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH,

[Continued on next page]

(54) Title: DRIVING A PLASMA DISPLAY PANEL



(57) Abstract: A three electrode PDP comprises a scan driver (SD) which supplies a substantially sine wave shaped voltage (VS) between first and the second scan electrodes (SEi, CEi), an amplitude of the substantially sine wave shaped voltage (VS) being large enough to sustain plasma cells (PCij), but being too small to ignite the plasma cells (PCij). A data driver (DD) supplies a substantially pulse shaped voltage (VD) to the data electrodes (DEi) for controlling an amount of light produced by the plasma cells (PCij). The sine wave shaped voltage may have a predetermined frequency such that more than one stable light output level is obtained.

WO 2004/015666 A1



PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**Published:**

— with international search report

## INTERNATIONAL SEARCH REPORT

PCT/IB 03/02819

**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC 7 G09G3/28

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
 IPC 7 G09G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 1 161 832 A (UNIVERSITY OF ILLINOIS FOUNDATION) 20 August 1969 (1969-08-20) page 12, line 102 -page 13, line 7 page 15, line 5 - line 114 page 16, line 25 - line 115 page 19, line 127 -page 20; figures 11,12,14,17,18,20	1-11
A	EP 0 488 891 A (FUJITSU LTD) 3 June 1992 (1992-06-03) page 3, line 45 - line 47 page 5, line 35 - line 51; figures 6,8 -/--	1-11

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

## \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*Z\* document member of the same patent family

Date of the actual completion of the international search

24 October 2003

Date of mailing of the international search report

20/11/2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
 NL - 2280 HV Rijswijk  
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
 Fax: (+31-70) 340-3016

Authorized officer

O'Reilly, D

## INTERNATIONAL SEARCH REPORT

PCT/IB 03/02819

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 3 877 006 A (PORTMANN JACQUES ET AL) 8 April 1975 (1975-04-08) abstract column 2, line 40 - line 67 column 4, line 20 - line 64 column 5, line 1 -column 6, line 30 column 8, line 55 -column 9, line 6; figures 2,3,6 ---	1-11
A	US 3 614 739 A (JOHNSON WILLIAM E) 19 October 1971 (1971-10-19) abstract column 3, line 6 - line 25 column 5, line 4 - line 51 column 7, line 9 - line 15; figure 2 ---	1-11
A	H.J. HOEHN ET AL: "A 60 Line per Inch Plasma Display Panel" IEEE TRANSACTIONS ON ELECTRON DEVICES., vol. ED-18, no. 9, 1 September 1971 (1971-09-01), pages 659-663, XP002259049 IEEE INC. NEW YORK., US ISSN: 0018-9383 abstract page 661, right-hand column, line 11 -page 663, left-hand column, line 21; figures 10-12 -----	

## INTERNATIONAL SEARCH REPORT

Information on patent family members

PCT/IB 03/02819

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 1161832	A	20-08-1969	BE 692791 A	18-07-1967
			CH 481450 A	15-11-1969
			DE 1614911 A1	05-01-1972
			FR 1522257 A	26-04-1968
			GB 1161833 A	20-08-1969
			NL 6700774 A ,C	19-07-1967
			SE 335031 B	10-05-1971
			US 3559190 A	26-01-1971
EP 0488891	A	03-06-1992	JP 3259253 B2	25-02-2002
			JP 4195188 A	15-07-1992
			DE 69122722 D1	21-11-1996
			DE 69122722 T2	06-03-1997
			DE 69125508 D1	07-05-1997
			DE 69125508 T2	10-07-1997
			EP 0488891 A2	03-06-1992
			EP 0674303 A2	27-09-1995
			KR 9503979 B1	21-04-1995
			US 5541618 A	30-07-1996
			US 6630916 B1	07-10-2003
			US 5724054 A	03-03-1998
			US 6097357 A	01-08-2000
US 3877006	A	08-04-1975	FR 2159631 A5	22-06-1973
			DE 2253969 A1	10-05-1973
			GB 1397454 A	11-06-1975
			JP 48055629 A	04-08-1973
US 3614739	A	19-10-1971	BE 749787 A1	01-10-1970
			CA 929640 A1	03-07-1973
			CH 526828 A	15-08-1972
			DE 2021302 A1	12-11-1970
			ES 379220 A1	01-02-1973
			FR 2047203 A5	12-03-1971
			GB 1315375 A	02-05-1973
			IL 34441 A	25-10-1973
			JP 57037875 B	12-08-1982
			NL 7006462 A	04-11-1970
			NO 132116 B	09-06-1975
			US 3754161 A	21-08-1973
			ZA 7002851 A	29-12-1971